

## Scope

These Best Management Practices (BMP) are directed at the northern goshawk (*Accipiter gentilis atricapillus*) inhabiting British Columbia east of the Coast Mountain divide. They are not intended for the threatened coastal goshawk subspecies (*A. g. laingi*).

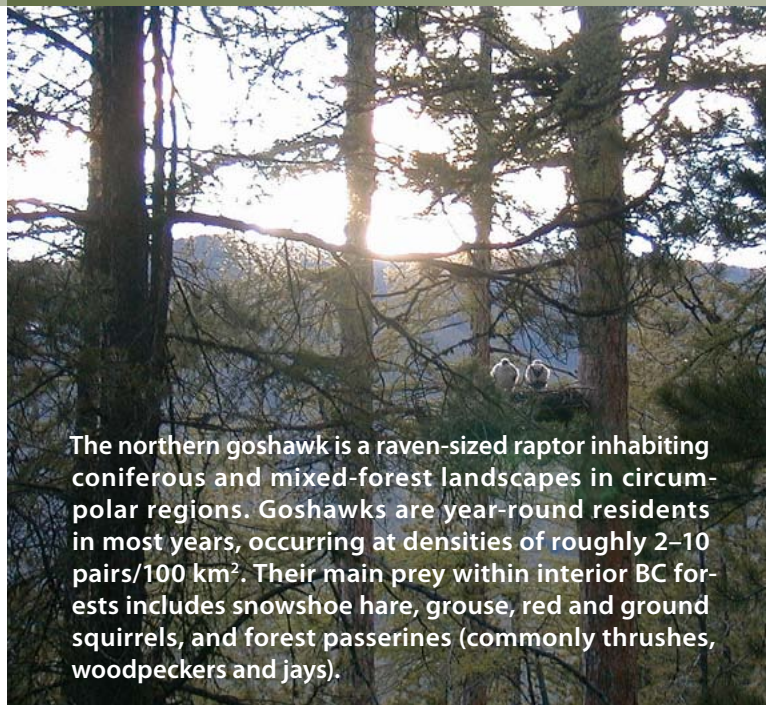
These recommendations focus on maintaining nesting and post-fledging areas (together known as the breeding area) at known goshawk nesting sites. Although foraging habitat and prey availability at larger spatial scales also influence breeding area occupancy, there is limited information to support strong science-based recommendations at these scales.

These BMPs were developed by a team of biologists with collectively over 50 years experience studying goshawks in relation to forest management. They are based on the best available science, including data from two, 10-year studies on goshawks and forest management in the East Kootenay (southeastern) and Skeena (northern) regions of British Columbia.

Goshawk Nest — Kari Stuart-Smith



## Goshawk Ecology



The northern goshawk is a raven-sized raptor inhabiting coniferous and mixed-forest landscapes in circum-polar regions. Goshawks are year-round residents in most years, occurring at densities of roughly 2–10 pairs/100 km<sup>2</sup>. Their main prey within interior BC forests includes snowshoe hare, grouse, red and ground squirrels, and forest passerines (commonly thrushes, woodpeckers and jays).

Nestling goshawks — Erica McClaren

Goshawks typically nest in mature and old stands with a closed canopy and open understory. They build large stick nests (ca. 100 cm diameter) in most years, often situated on the first branch whorl of the largest trees in the stand. A nest area may contain 1–6 or more nests in close proximity (< 600 m, often much closer) to each other. For successful reproduction, goshawks also need a post-fledgling area around or near their active nests. Here, young (fledgling) goshawks are protected from predators while they learn to fly and hunt, until they disperse by mid-August.

Together, the nest area and the associated post-fledgling areas are called the **breeding area**. Breeding areas in interior BC tend to be spaced regularly every 4–6 km across the landscape, corresponding to breeding territory sizes of approximately 2400 ha.

Goshawks display strong fidelity to breeding areas. Once established, a breeding area may be used intermittently for years or decades, including continued use after failed breeding attempts and occupation by new individuals when the previous occupants die.

## Interior BC Goshawk Science Team

William L Harrower, MSc, RPBio  
High-Country Consulting Ltd.  
Vancouver, BC  
harrower@shaw.ca

Todd Mahon, MSc, RPBio  
Wildfor Consultants Ltd.  
Edmonton, AB  
todd.mahon@gmail.com

Kari Stuart-Smith, PhD, RPBio  
Tembec  
Cranbrook, BC  
kari.stuart-smith@tembec.com

Erica McClaren, MSc, RPBio  
BC Ministry of Environment  
West Coast Region  
Erica.McClaren@gov.bc.ca

Frank Doyle, MSc, RPBio  
Wildlife Dynamics  
Smithers, BC  
doyle@bulkley.net

### For further information see —

*The Scientific basis for Managing Northern Goshawk Breeding Areas: Best Management Practices*

available at  
[www.forrex.org/publications/forrexseries/series.asp](http://www.forrex.org/publications/forrexseries/series.asp)  
or  
[www.highcountryconsulting.ca/bcgoshawk](http://www.highcountryconsulting.ca/bcgoshawk)  
or  
contact the Goshawk Science Team member nearest you

Adult goshawk — Todd Mahon

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# Best Management Practices for Northern Goshawk Breeding Areas in the Interior of British Columbia

March 2011

# Breeding Area Identification and Occupancy Status

Once a goshawk nest is found, systematic surveys of the area by a qualified biologist with previous goshawk experience should be conducted to locate alternative nests and characterize the forest within the breeding area. Appropriate survey methodology is found in the *Scientific Basis* document accompanying this brochure.

'Not breeding' or 'unoccupied' status can only be inferred with a high degree of confidence after repeated surveys fail to detect breeding goshawks during the nestling and post-fledgling periods. Failure to detect goshawks during at least two surveys on different days during the nestling stage alone provides moderate support that the breeding area is not occupied. Failure to detect a goshawk during the incubation period cannot be used to infer unoccupied status because detectability rates are low during this time. Occupancy assessment during the courtship period is not recommended because detectability at this time is highly variable and presence only confirms breeding area occupancy and not whether the goshawks will actually reproduce in that year.

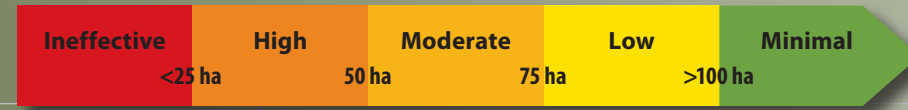


Fledgling Goshawk — William Harrower

## Landscape Considerations

Eighty-five percent of the 119 goshawk territories in our studies contained more than 30% mature and old forest within a 3 km radius of the breeding area, and half of them had more than 50%. Breeding areas in territories with less than these amounts may not maintain occupancy, regardless of the size of the breeding area reserve.

# Reserve Design



Reserve Size and Risk of Breeding Area Abandonment

The size of the breeding reserve is a key factor affecting its continued use by goshawks. Reserve size refers to the total, contiguous, amount of forest suitable for nesting and containing the goshawk nests. Reserves >100 ha have the highest probability of continued occupancy; reserves <25 ha will not maintain long-term occupancy.

### Try to:

- **include** as many known nests within the reserve as possible
- **buffer** nests by 200 m where practicable
- **maximize** the amount of forest suitable for nesting within the reserve; focus on closed canopy mature or old forest with open understory (structural stage 5–7 with evident self-thinning and open, subcanopy flyways), adding other forest types as necessary to make a contiguous forest patch. Unsuitable breeding habitat may be included in the reserve for biodiversity objectives but should not count towards the total area of the reserve.
- **minimize** the edge: area ratio, especially the edge adjacent to stands <40 years old; avoid narrow ribbons <200 m in width
- **connect** the reserve to adjacent forest to increase its effective size and provide linkages to foraging habitat beyond the breeding area
- **when** managing multiple breeding areas, do not manage all areas at ineffective or high risk levels



Juvenile Goshawk — Sarah Rose, flickr

Goshawks can reuse breeding areas for many years. If a breeding area is adequately protected, goshawks will likely continue using that area, alleviating further management conflicts with breeding goshawks over the 2400 ha breeding territory. If the breeding area is inadequately protected the goshawks will likely establish a new breeding area that may conflict with future harvest plans, perpetuating the management conflict.

# Timing Restrictions

Direct disturbance may disrupt goshawk breeding behaviour, causing nest failure or breeding area abandonment. Ideally, restrict industrial activities near an active nest from Feb 15–Aug 15. If this is not practicable, conduct them outside the most sensitive period of Mar 15–July 1, or plan activities closest to active nests outside this period. Unoccupied Breeding Areas do not require timing restrictions.

## Very High Disturbance

keep >1 km away from Feb 15–Aug 15

- repeated low elevation (<1000 ft) helicopter over-flights
- continuously operating drilling rig or well flaring
- blasting

## High Disturbance

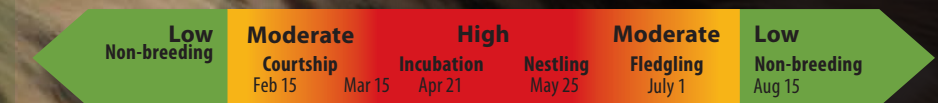
keep >500 m away from Feb 15–Aug 15

- road building
- logging
- pipeline and wellsite construction
- denotation of seismic charges
- seismic line cutting
- windtower construction

## Low and Moderate Disturbance

no timing restrictions

- silvicultural activities (planting, site prep)
- hauling
- road maintenance
- seismic line hand-cutting
- public and industrial traffic



Risk of Disturbance Impacting Breeding Activities